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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
3100 Port of Benton Blvd • Richland, WA 99352 • (509) 372-7950

July 2, 2004

Mr. Roy Schepens, Manager
Office of River Protection
United States Department of Energy
P.O. Box 450
Richland, Washington 99352

Mr. Jim Henschel, Project Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99352

Dear Mr. Schepens and Mr. Henschel:

Re: Notice of Non-Compliance for Failure to Consider Corrosion Allowance in Piping Design as Required by American Society of Mechanical Engineers (ASME) Code B31.3

On June 17, 2004, the Washington State Department of Ecology (Ecology) requested a meeting with Bechtel National, Inc. (BNI) to discuss how corrosion allowance had been factored into design of the 2" Schedule 80S Waste Feed Evaporation Process System (FEP) concentrate recycle line FRP-PZ-01826-S12A-02 to FRP-VSL-00002A (ref. calculation 24590-PTF-P6C-FRP-00050).

On June 25, 2004, Ecology met with BNI and was informed that while corrosion allowance is considered in sizing Waste Treatment and Immobilization Plant (WTP) piping for internal and external pressure, it is not considered in calculation of longitudinal stress. *Piping Material Class Description*, 24590-WTP-PER-PL-02-001, which is incorporated into the WTP Permit, identifies ASME B31.3 as the appropriate design code for process piping and specifies 0.0937" corrosion allowance for the piping covered in the cited calculation. Failure to include corrosion allowance in design for longitudinal stress appears to conflict with paragraph 302.3.5(c) of ASME B31.3., which says "The thickness of pipe used in calculating S_L shall be the nominal thickness T minus mechanical, corrosion, and erosion allowance c, for the location under consideration." BNI representatives told Ecology they were not aware whether a code interpretation had been rendered by the ASME B31.3 committee that would allow deviation from this requirement, but stated that a BNI position paper justifying this approach had been prepared. Ecology requested a copy of the position paper, which has not been provided to date.

Failure to include corrosion allowance in design of piping for longitudinal stress potentially compromises structural integrity of WTP tank systems and violates design requirements BNI has committed to follow.

As a result of Ecology's review of this matter, BNI and the United States Department of Energy-Office of River Protection (USDOE-ORP) have incurred the following violations and concerns:

VIOLATION:

1) **Hanford Waste Treatment and Immobilization Plant Permit, Condition III.10.E.2.a.**

   USDOE-ORP and BNI have initiated fabrication and construction of tank systems based on process piping design that fails to meet permitted design requirements as defined in Attachment 51 of the WTP Permit, as required by WTP Permit Condition III.10.E.2.a.

   The Permittees are required to construct tank systems in accordance with permit requirements, including compliance with ASME B31.3 design and fabrication code for WTP process piping. Design of WTP process piping and pipe supports is underway and has been completed for some systems, without consideration of corrosion allowance in design for longitudinal stress. Fabrication and installation of WTP piping and piping supports has been initiated, based on piping design that does not address corrosion allowance for longitudinal stress, as required by ASME B31.3.

2) **Hanford Waste Treatment and Immobilization Plant Permit, Condition III.10.E.9.d**

   Design review reports for ancillary equipment submitted by the Independent Qualified Registered Professional Engineer (IQRPE) for USDOE-ORP and BNI do not include review of pipe stress calculations for process piping required to be designed in accordance with ASME B31.3, as required by WTP Permit Condition III.10.E.9.d.(i).

   The Permittees are required to submit IQRPE reports for ancillary equipment that include a review of design calculations and other documentation on which the IQRPE certification is based. The IQRPE report for the waste feed receipt system ancillary equipment, which applies to piping covered in BNI calculation 24590-PTF-P6C-FRP-00050, does not indicate that calculation had been reviewed. Instead, the IQRPE report indicates that the BNI Pipe Stress Design Criteria, 24590-WTP-DC-PS-01-001, Rev. 1, was reviewed, and states "The Pipe Stress Design Criteria requires the use of the ASME B31.3 code for piping design. ASME B31.3 requires explicit consideration of operating pressure, operating temperature, thermal expansion/contraction, settlement, vibration, and corrosion allowance in the design of piping." The IQRPE certification statement

attests "My duties were independent review of the current design for the Pretreatment Facility Waste Feed Receipt System (FRP) Ancillary Equipment as required by the Dangerous Waste Regulations, namely, Washington Administrative Code (WAC) 173-303-640(3) applicable paragraphs, i.e., (a) through (g)." Contrary to WTP Permit requirement III.10.E.9.d.(i), which requires review of design calculations, the IQRPE has reviewed only the design intent, as indicated by his certified statement "The documentation reviewed indicate that the design intent fully satisfies the requirements of the WAC."

In order to correct the violations identified in this notice of non-compliance, USDOE-ORP must complete the following corrective measures within the time frames specified. Failure to perform the corrective measures described below may result in the issuance of an administrative order and/or penalties per Revised Code of Washington (RCW)70.105.080. A request for additional time to complete the corrective measure identified in this notice of non-compliance must be in writing, describe the reasons for the request for additional time, and received by me for consideration no later than July 22, 2004.

CORRECTIVE MEASURES:

1) On or before July 8, 2004, BNI must submit technical justification that it has relied on in support of its decision to not comply with ASME B31.3 requirements to consider corrosion allowance in design of piping for longitudinal stress.

2) On or before July 15, 2004, BNI must reanalyze FRP-PZ-01826-S12A-02 with addition of corrosion allowance as the only change, and submit draft revised calculation 24590-PTF-P6C-FRP-00050 reflecting that change. With the revised calculation, provide a discussion of the effect on calculated piping stress and support loads for this line, and address implications for other WTP process piping systems.

3) Pending submittal and Ecology review of items (1) and (2) above, additional Corrective Measures may be imposed as a consequence of these violations.

CONCERNS:

1) Failure to consider corrosion allowance in design of piping systems for longitudinal stress, in violation of ASME B31.3 requirements, places WTP at risk of failure of tank systems. Ecology will suspend review of permit packages covering ASME B31.3 process piping until this issue is resolved.

2) It is evident from this example that the IQRPE's evaluation of design intent, rather than completed design including design calculations, falls short of meeting WTP Permit requirements and undermines confidence that WTP tank systems will have sufficient structural integrity and are acceptable for the storing and treating of dangerous waste, if constructed in accordance with completed design. Pending resolution of this issue, Ecology will suspend review of WTP permit packages that do not reflect review of completed designs, including vendor designs.

If there are any questions regarding this letter, please contact me at (509) 372-7892 or Ed Fredenburg at (509) 372-7899.

Sincerely,

for Suzanne Dahl
Tank Waste Disposal Project Manager
Nuclear Waste Program

SD:EF:lkd

cc:
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